

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁶ : B05C 17/06</p>	<p>A1</p>	<p>(11) International Publication Number: WO 00/12224 (43) International Publication Date: 9 March 2000 (09.03.00)</p>
<p>(21) International Application Number: PCT/US99/19475 (22) International Filing Date: 26 August 1999 (26.08.99) (30) Priority Data: 09/143,927 29 August 1998 (29.08.98) US 09/199,512 25 November 1998 (25.11.98) US (63) Related by Continuation (CON) or Continuation-in-Part (CIP) to Earlier Application US 09/143,927 (CIP) Filed on 29 August 1998 (29.08.98) (71)(72) Applicant and Inventor: McKILLIP, John, J. [US/US]; 4100 West Grand Avenue, Chicago, IL 60651 (US). (74) Agents: SAMPLES, Kenneth, H. et al.; Fitch, Even, Tabin & Flannery, Room 1600, 120 South LaSalle, Chicago, IL 60603 (US).</p>		<p>(81) Designated States: AU, CA, US. Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p>
<p>(54) Title: METHOD AND APPARATUS FOR PRODUCING BUSINESS FORMS</p> <div data-bbox="324 1134 1299 1407"></div> <p>(57) Abstract</p> <p>A method and apparatus for manufacturing multiple die cut business forms is disclosed. One embodiment of a printing press (10) according to the present invention includes a number of different stations (24, 26) that are connected together by a continuous web (14). Multiple die cut business forms are produced by a continuous process from stock paper (14) to an output configuration such as continuous roll, fan fold, or cut sheet. One aspect of the present invention is that a silicone treated glassing stock paper (14) substrate can be utilized to allow business forms to be produced with minimized curling.</p>		

Best Available Copy

-1-

METHOD AND APPARATUS FOR PRODUCING BUSINESS FORMS

5

Field of the Invention

The present invention generally relates to a method and apparatus for manufacturing business forms and, more particularly, to a method and apparatus for producing multiple-die cut business forms for a variety of applications.

10

Background of the Invention

U.S. Patent No. 4,379,537 to Lomeli et al. discloses a business form with a removable label and a method for producing the same. According to the Lomeli et al. patent, a paper substrate in the form of either individual sheets or a continuous strip is fed into a paper processing apparatus. The paper process apparatus produces the business form having a removable label disposed thereon by a method comprising the steps of imprinting information on the paper substrate, applying transfer tape to the paper substrate, die cutting the substrate to form a label, and subsequently collating, cutting, or storing the resulting product. The disclosure of U.S. Patent No. 4,379,537 is hereby incorporated by reference herein.

20

There are various devices that are currently available for producing business forms such as integrated labels in accordance with, for example, the method and apparatus disclosed in the Lomeli et al. patent. A number of such devices are commercially available from a company called Tamarack. The Tamarack devices produce a number of different types of business forms including label/form

25

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

- 2 -

combinations, integrated labels, integral cards, fold and seal mailers, stencil/form combinations, continuous envelopes, affixed windows, promotional forms, and the like.

A source of pin-feed paper having pin hole punching disposed at a generally uniform interval along both sides of the paper allow it to be fed through the device. Such

- 5 Tamarack devices generally include a pin-feed paper infeed unit, a vacuum applicator unit, an unwind unit containing transfer tape, a hot melt applicator head, a feed control unit, and integral die cut unit, a hot melt unit, and a roll/fold/sheet delivery unit. Typically, the pin-feed paper that is fed into the Tamarack device is manufactured on a separate piece of equipment that, most usually, is owned and operated by a separate
- 10 company from the company that runs the Tamarack device.

What is desired is an improved method and apparatus for manufacturing multiple die cut business forms.

Summary of the Invention

It is desirable to provide a printing press that produces multiple die cut business forms in a variety of output configurations directly from stock paper via a continuous web, in-line process.

Such a printing press that produces multiple die cut business forms from stock paper via a continuous web, in-line process has a number of advantages. First, the costs of manufacturing business forms are reduced because the forms are produced with one piece of equipment. Second, the costs of manufacturing business forms is reduced because there is no need to perform any secondary operations on the stock paper fed into the printing press such as line hole punching. Third, the labor costs associated with manufacturing business forms are significantly reduced because a lesser number of personnel is needed to run the printing press during operation and there is no need for any separate affixing operations.

It also is desirable to produce a partially processed business form with a printing press such as, for example, the above-referenced printing press by a method including the steps of providing a glassine substrate, silicone treating the glassine substrate, and applying adhesive directly to the silicone treated glassine substrate.

Producing a partially processed business form in this manner has a number of advantages. First, the silicone treated glassine substrate can be utilized in printing presses as, for example, described herein with minimized curling. Second, pressure sensitive labels manufactured in accordance with this process can be utilized more effectively because, for example, the label can be easily removed from the substrate.

Other features and advantages of the invention will become apparent from the description that follows.

Brief Description of the Drawings

5 Fig. 1 is a side view of one embodiment of a printing press that is used to manufacture multiple die cut business forms according to the principle of the present invention;

Fig. 2 is a schematic diagram that illustrates various operations that are performed by the printing press shown in Fig. 1;

10 Figs. 3-5 illustrate three embodiments of multiple die cut business forms that can be produced by the printing press shown in Fig. 1;

Fig. 6 is a partial sectional view of one embodiment of a multiple die cut business form that is produced by the printing press shown in Fig. 1;

15 Figs. 7-8 are perspective, diagrammatic illustrations of manners for collating or storing the multiple die cut business forms produced by the printing press shown in Fig. 1; and

Figs. 9-10 illustrate exemplary multiple die cut business forms comprising a dual-language pharmacy label according to one aspect of the present invention.

- 4 -

Detailed Description of the Invention

While the present invention is susceptible of embodiment in various forms, there is shown in the drawings and will hereinafter be described presently preferred embodiments with the understanding that the present disclosure is to be considered an
5 exemplification of the invention and is not intended to limit the invention to the specific embodiments illustrated.

A side view of one embodiment of a printing press 10 that is used to manufacture multiple die cut business forms according to the principle of the invention is shown in Fig. 1. Printing press 10 comprises a number of individual
10 stations that perform specified functions and are connected together by a continuous web so that, for example, multiple die cut business forms may be manufactured in a variety of output configurations directly from a source of stock paper as described in greater detail hereafter.

Printing press 10 includes a receiver station 12 upon which a source of stock
15 paper is mounted. In the embodiment shown in Fig. 1, the stock paper source comprises a roll 14 of stock paper that is rotatably mounted on receiver section 12 by means of axle 16. Printing press 10 is used to manufacture multiple die cut business forms directly from the stock paper roll 14 without the need for any secondary processing such as line-hole punching or separate affixing operations prior to
20 beginning the manufacturing process.

Printing press 10 includes two printing stations 20 and 22 that are connected to the receiver station 12 by means of a continuous web. A die cutting station 18 is connected to the printing stations 20 and 22 by the continuous web. Two printing stations 24 and 26 are connected in series by the continuous web to die cutting station
25 18. The continuous web connects an adhesive strip-patch station 28 to printing station 26. Adhesive strip-patch units suitable for use with the present invention are commercially available from a company called Tamarack (Wauconda, Illinois).

Three post adhesive patch die cutting stations 30, 32, and 34 are connected in-line with the adhesive strip-patch station 28 by the continuous web as shown. The continuous web connects a finishing station 36 to the third post adhesive patch die cutting station 34 via punching station 38 as shown in Fig. 1. The various stations 14-5 34 and 38 perform various operations in a predetermined order so that various types of multiple die cut business forms may be produced in the output configuration specified by finishing station 36 as discussed in greater detail hereafter.

One aspect of the present invention is that a roll of glassine paper may be utilized as the roll of stock paper 14 shown, for example, in Fig. 1. Glassine paper is 10 supercalendered, is manufactured principally from chemical wood pulps which have been beaten to secure a high degree of stock hydration, has a smooth finish, and is transparent. The physical make-up of glassine paper allows it to have a high degree of resistance to the passage of air, to be almost impervious to the passage of water vapor, and to be grease resistant. Glassine paper can be provided in various colors 15 and, if desired, can be made opaque by the addition of various fillers as readily apparent to those of ordinary skill in the art to which this invention pertains. A glassine paper substrate is provided with a silicone treatment which typically may be accomplished at the mill where the substrate is manufactured. This allows, for example, pressure sensitive labels to be manufactured with reduced curling.

20 Fig. 2 is a schematic diagram that illustrates various operations that are performed by the printing press shown in Fig. 1. Paper from the stock paper roll 14 may be die cut by die cutting station 18 in any desired shape as, for example, shown at location 40. Preferably, the shape of the operation performed by die cutting station 18 is dictated by the type of business form being produced by the printing press 10 in 25 a particular application. Locations 42 and 44 indicate examples of printing operations that can be performed by printing stations 20, 22, 24, and 26. It should be noted that printing stations can perform a variety of printing operations including, for example,

multi-color printing as readily apparent to those of ordinary skill in the art to which this invention pertains.

One aspect of the present invention that provides significant cost advantages is that the printing press 10 totally eliminates the use of stand-alone, off-line affixing which typically is accomplished by means of a communicator, a web attacher, or other off-line affixing equipment that is totally separate from a prior art printing press. Utilization of the printing press 10 to manufacture multiple die cut business forms allows affixing to occur either on the front of a form to produce a reverse-frame stencil or on the back of the form to produce an integrated stencil via a totally in-line process.

Referring back to Fig. 2, the adhesive strip/patch unit 28 allows an adhesive patch 46 to be removably affixed to the paper backing from the stock paper roll 14. Unit 28 may be programmed to allow patch 46 to have any desired length and shape. Die cutting units 30, 32, and 34 perform post-adhesive patch/strip operations as needed in accordance with the type of multiple die cut business form being prepared in a particular application as desired and as shown at location 48. Punching station 48 is provided in the continuous web from receiver station 12 to finishing station 36 to allow the multiple die cut business forms to be produced by printing press 10 in a given application to have line-hole punching as shown at 50 and 52 or perforations. Figs. 3-5 show additional examples of the die cutting and punching operations that can be performed by die cutting stations 30, 32, and 34 as well as punching station 38.

One aspect of finishing unit 36 is to process the multiple die cut business forms produced by printing press 10 in one of three output configurations: output roll form as shown at 54 in Fig. 7, cut sheet form as shown at 56 in Fig. 2, and fan-fold form as shown at 58 in Fig. 8.

Fig. 6 is a partial sectional view of one embodiment of a multiple die cut business form 60 that is produced by the printing press shown in Fig. 1. Business

- 7 -

form 60 includes a substrate portion 62 that is die cut by the die cutting station 18 to form a die cut portion 64. An adhesive patch 66 is secured to a desired portion of the business form 60 as shown.

The functions provided by the various stations of printing press 10 can be applied in any desired way to allow a variety of different types of business forms to be produced as discussed in greater detail hereafter. For example, one unique aspect of the present invention is that an adhesive patch can be applied to an integrated stencil, label, or pocket as well as delivering a finished product at the end of the printing press in cut sheet, continuous, or roll form which obviates the need for line-hole punching or any other secondary operations to be performed on the stock paper that is mounted on receiver station 12.

Another aspect of the present invention is to allow multiple die cutting operations to be performed on a cut-sheet integrated label, stencil, pocket or the like while simultaneously printing graphics on the form, both prior to and after the application of an adhesive patch as well as post-operation die cutting and perforating. Materials suitable for use in the printing press 10 in this case include, for example, plastic, films, tough papers, tags, card stocks, vinyl, stencil material and the like. Additionally, an easy-removal thumb notch can be provided in a business form while it is being manufactured in-line in the printing press 10 by means of the die cutting stations 18 and 30, 32, and 34 both prior to and after the application of the adhesive patch by station 28.

Integrated stencils can be manufactured by printing press 10 in continuous, cut sheet, or roll form by affixing stencil material in-line while simultaneously printing the form graphics, then die-cutting the back of the stock and removing the die cut material. This also provides the option of forming a label for address identification by die cutting the stencil material and leaving ties so that, for example, a die cut round cornered rectangle remains in the form after direct contact, non-contact, or

- 8 -

thermal imaging processing.

Another aspect of the present invention is that the printing press 10 can be utilized to provide horizontal perforations at predetermined intervals on multiple die cut business forms that are processed by finishing station 36 either in cut sheet, continuous fan-folded, or roll form. Applications of the present invention in this context includes invoices, packing lists, bills of lading, letterhead and the like. In this case, the business form is provided with two labels, one of which would be formed so that it could be immediately removed during use and placed on an envelope on which will be printed the name and the address of the recipient and the sender. The other label would be formed by a die cut with a perforation around its perimeter, with or without a thumb notch. The second label has the sender and recipient information reversed. Such business forms are particularly useful for any formal document that would have to be executed and returned to the sender such as, for example, legal papers or mortgage documents.

Referring to Figs. 9-10, exemplary multiple die cut business forms comprising a dual-language pharmacy label according to one aspect of the present invention are illustrated. Fig. 9 shows three pharmacy labels 68, 70, and 72 all of which include two sections having the same information printed in different languages. Figs. 9 and 10 show the English and Polish languages. The line-hole punching provided on both sides of the pharmacy labels is useful for dot-matrix printing or other line-hole type printing applications. However, it should be appreciated that this feature is optional because, for example, of the widespread use of laser printers. In any case, one side of the pharmacy label includes adhesive so that it may be bonded to a pill bottle 74 as shown in Fig. 10.

During use, the pharmacist prints the relevant pharmaceutical information in different languages on both sides of each one of the pharmacy labels 68, 70, and 72 and affixes the label to the bottle as shown in Fig. 10. This embodiment of a multiple

- 9 -

die cut business form has a number of unique advantages that generally prevent communication difficulties. For example, this embodiment is particularly advantageous in the home health care environment where the patient or domestic workers in the home do not speak the same language or speak different languages than emergency service personnel such as paramedics who service the area in question. For example, in a situation where a Polish speaking person was accidentally overmedicated and an English speaking paramedic arrived to render assistance, the use of the dual pharmacy labels shown in Figs. 9-10 allow the paramedic to immediately understand what type of medication was taken. This feature of the present invention allows patients to more precisely follow a prescribed prescription regimen and minimizes the potential danger for accidental overmedication or poisoning.

From the foregoing, it will be observed that numerous modifications and variations can be effectuated without departing from the true spirit and scope of the novel concepts of the present invention. It is to be understood that no limitation with respect to the specific embodiments illustrated is intended or should be inferred. The disclosure is intended to cover by the appended claims all such modifications as fall within the scope of the claims.

- 10 -

What is claimed is:

1. A printing press for producing multiple die cut business forms comprising, in combination:

- means for receiving a roll of stock paper, said stock paper roll being
5 mounted for rotation about an axis;
means for printing images on selected areas of said roll;
means for applying an adhesive patch to the selected areas of said roll;
means for die cutting selected areas of said roll and the adhesive patch
contiguous therewith; and
10 means for interconnecting said receiving means, said printing means,
said applying means, and said die cutting means together so that multiple die cut
business forms are produced and transported through the printing press by means of a
continuous web.

2. The printing press of claim 1 wherein said means for applying includes
15 means for receiving and mounting a roll of silicone treated backing paper and means
for applying adhesive to selected areas of said silicone treated backing paper to form
said adhesive patch.

3. The printing press of claim 2 wherein said backing paper comprises
glassine paper.

20 4. A printing press for producing multiple die cut business forms comprising, in combination:

- a receiver station in which a roll of stock paper is mounted for rotation
about an axis;
at least one printing station;
25 an adhesive patch station;
at least one die cutting station; and
a continuous web which receives stock paper from said receiver station

-11-

and supplies it to said at least one printing station, said adhesive patch station, and said at least one die cutting station to produce multiple die cut business forms.

5. The printing press of claim 4 wherein said adhesive patch station includes a receiver in which a roll of silicone treated backing paper is mounted for rotation about an axis and an applicator operatively coupled with said receiver, said applicator applying adhesive to selected areas of said silicone treated paper to form said adhesive patch.

6. The printing press of claim 5 wherein said backing paper comprises glassine paper.

7. A method of producing a patch that is to be affixed to a partially processed business form, said method comprising the steps of:
providing a glassine paper substrate;
silicone treating said glassine paper substrate; and
applying adhesive to said silicone treated substrate such that pressure sensitive labels can be formed with reduced curling.

8. A printing press for producing multiple die cut business forms comprising, in combination:

means for receiving a continuous roll of paper without line-hole punching;

means for printing images on selected areas of said roll; and

means for die cutting selected areas of said roll and the adhesive patch contiguous therewith.

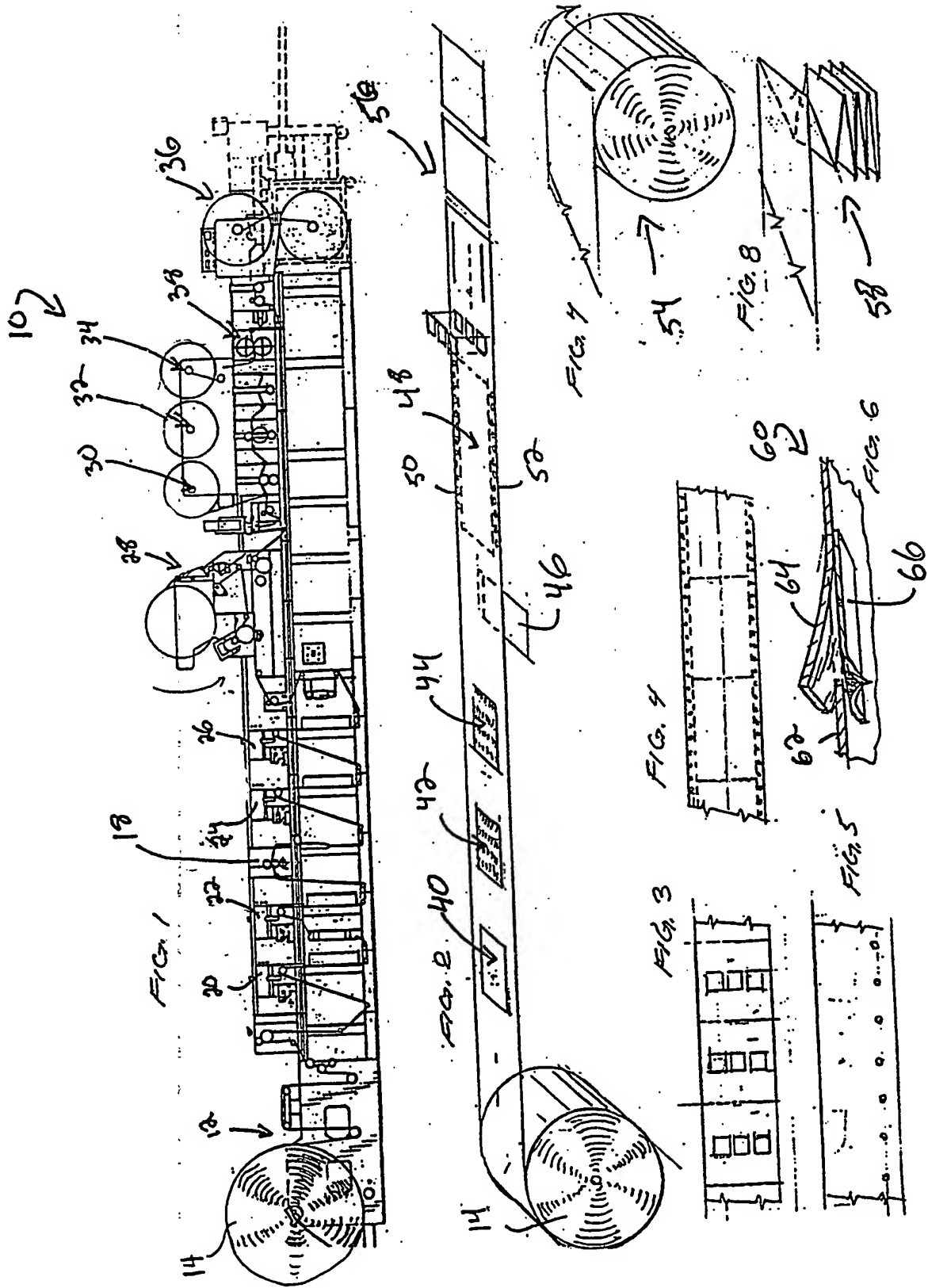
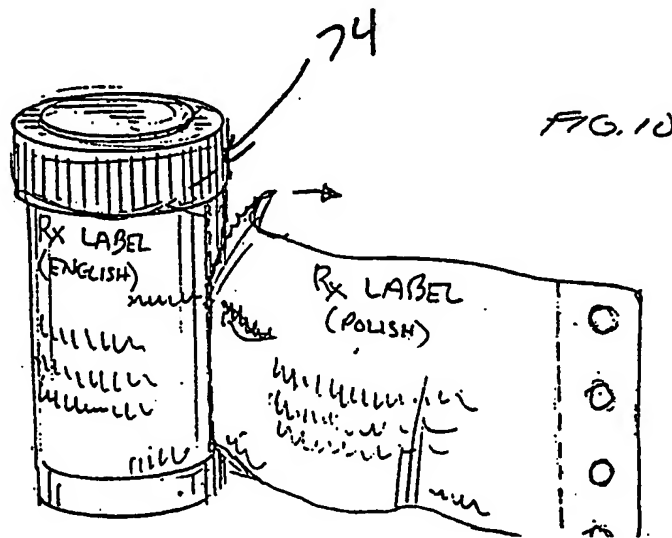
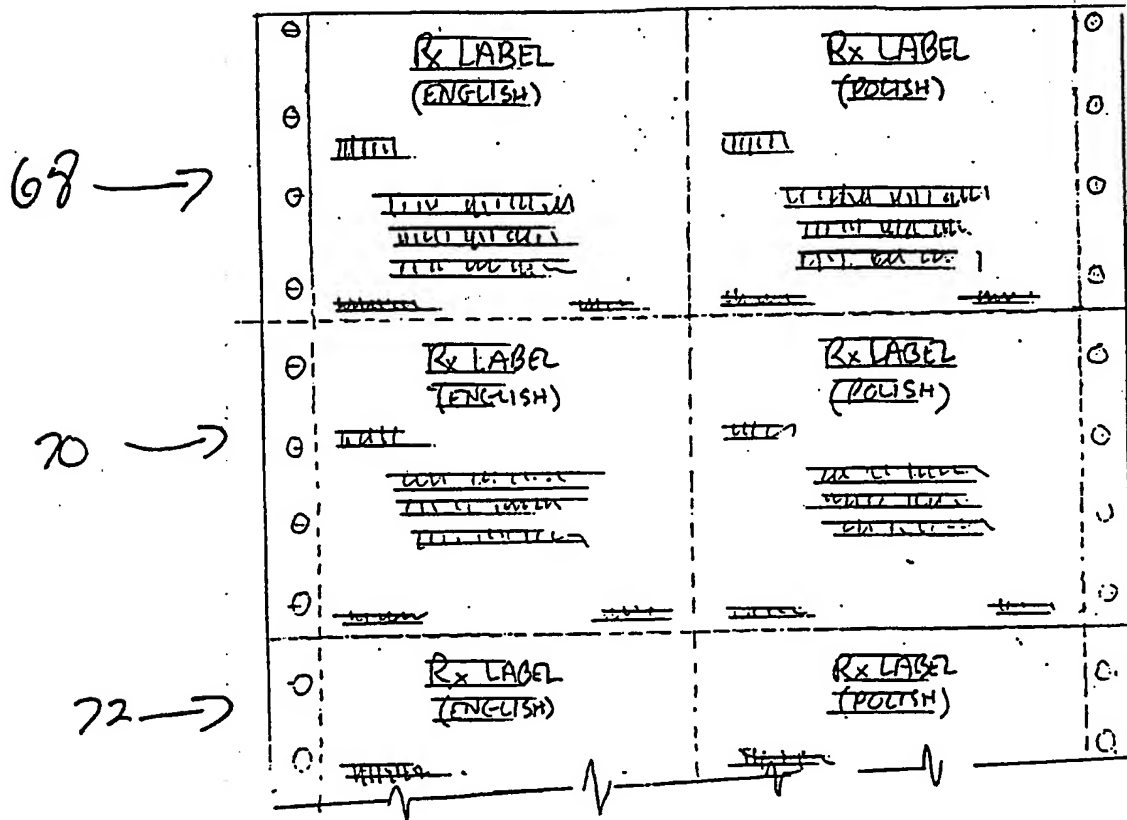


FIG. 9



**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☐ **FADED TEXT OR DRAWING**
- ☐ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☐ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.